Menlo Park Notebook #129 [N-80-09-09]

The dated entries in this notebook cover the period September-October 1880, but the book was probably begun earlier in the year. Most of the entries are by Francis Upton. There are also a few entries by Edison and probably by William J. Hammer. The material by Upton includes calculations about the cost of a central station; calculations about the conductors needed for the first New York central station (another member of the staff, probably Hammer, assisted Upton in gathering the statistics); and calculations concerning the location of the New York central station. The material by Edison includes calculations and drawings relating to tubes for conductors, along with calculations about the conductors needed for the New York central station. The label on the front cover is marked "Upton" and "Estimates Conductors." The book contains 284 numbered pages.

Blank pages not filmed: 174-175, 270-281.

Missing page numbers: 107-108, 223-226.

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120 BROADWAY, NEW YORK.

From Library,
~~GENERAL ELECTRIC.~~
44 Broad St, Nyc.

May 1, 1896

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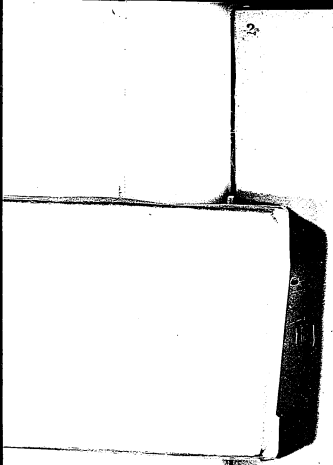


Magnets

7.5

3"

5 20
250
800
6
4800 lbs

24000
28800
31200

140

Wire on magnet

160 lbs Pennant machine

3
420
3
1260 0
336 0
1596

25
18
200
25
450

Canadia Machines

Poles 4000 lbs. @ 4cts	$160.
Magnet 4800 lbs	312.
Cu. Wire on magnet 420 lbs	169
Jr. castings Magnets	150.
	$ 782.
Armature	
Plates	$ 450.
Shaft Jr page 9	350.
Commutator 4 inch Eddies	200
Copper wire estimated	60
	1842

Labor will ~~bring it to about~~ Cost $200

2042

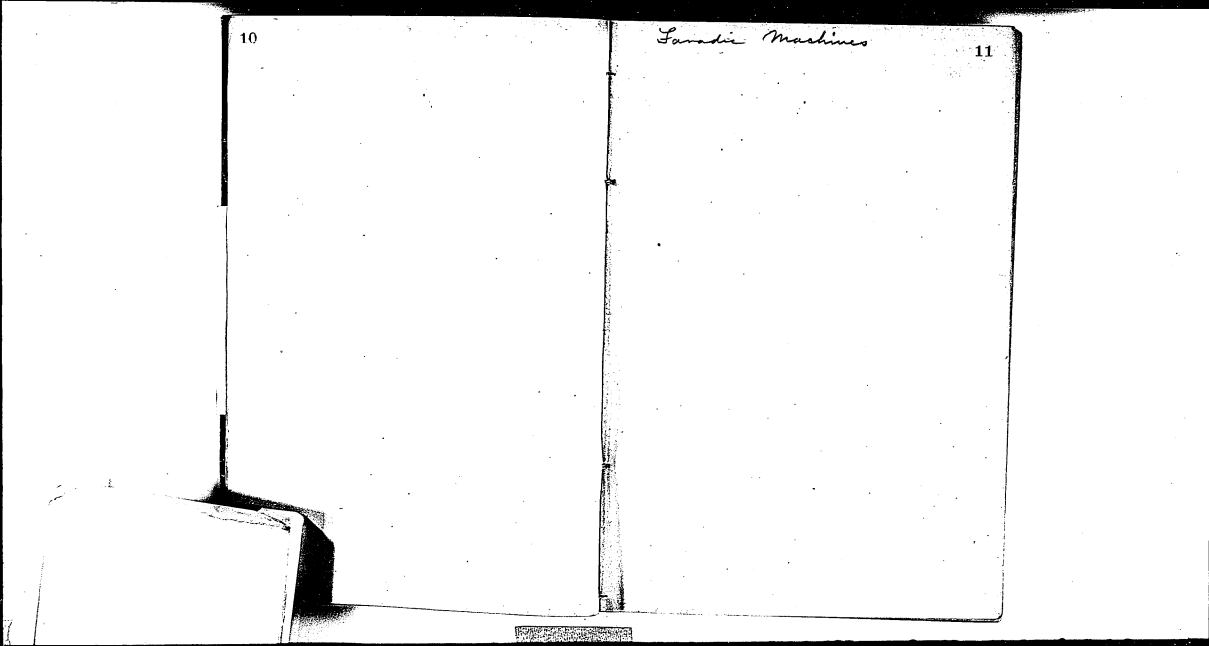
Plates 1800 @ $25. per hundred
$450

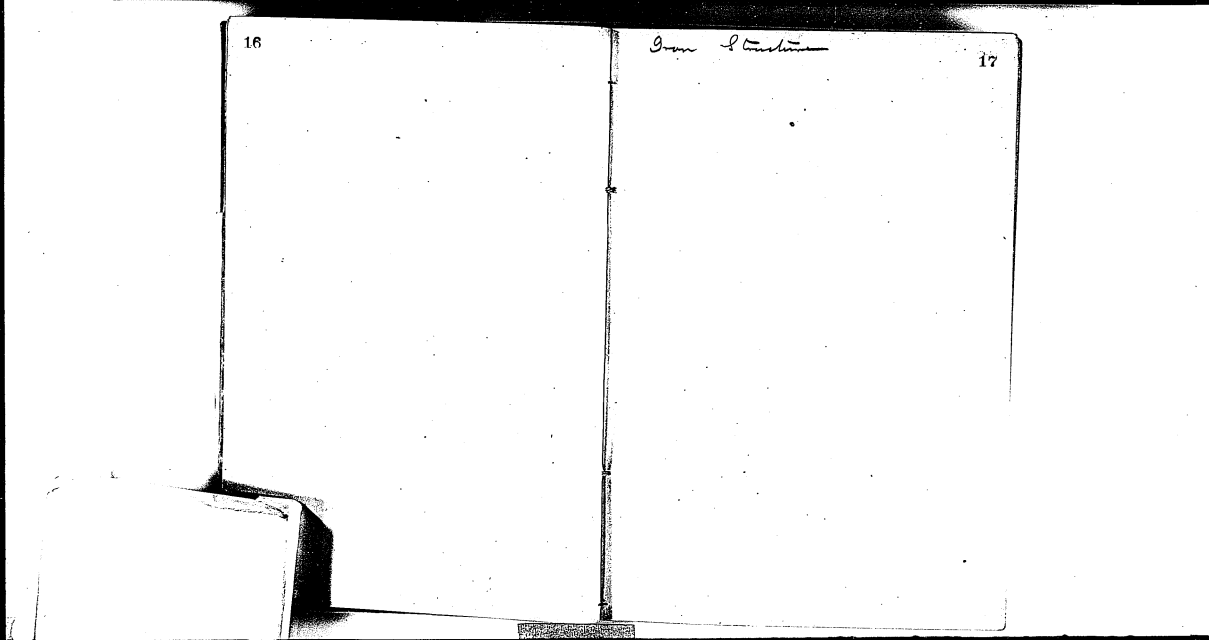
Magnets present machine
Bars 260 lbs.
260
back 280
900 lbs.
2 times as large
1600 lbs.
3 magnets
4800 lbs.

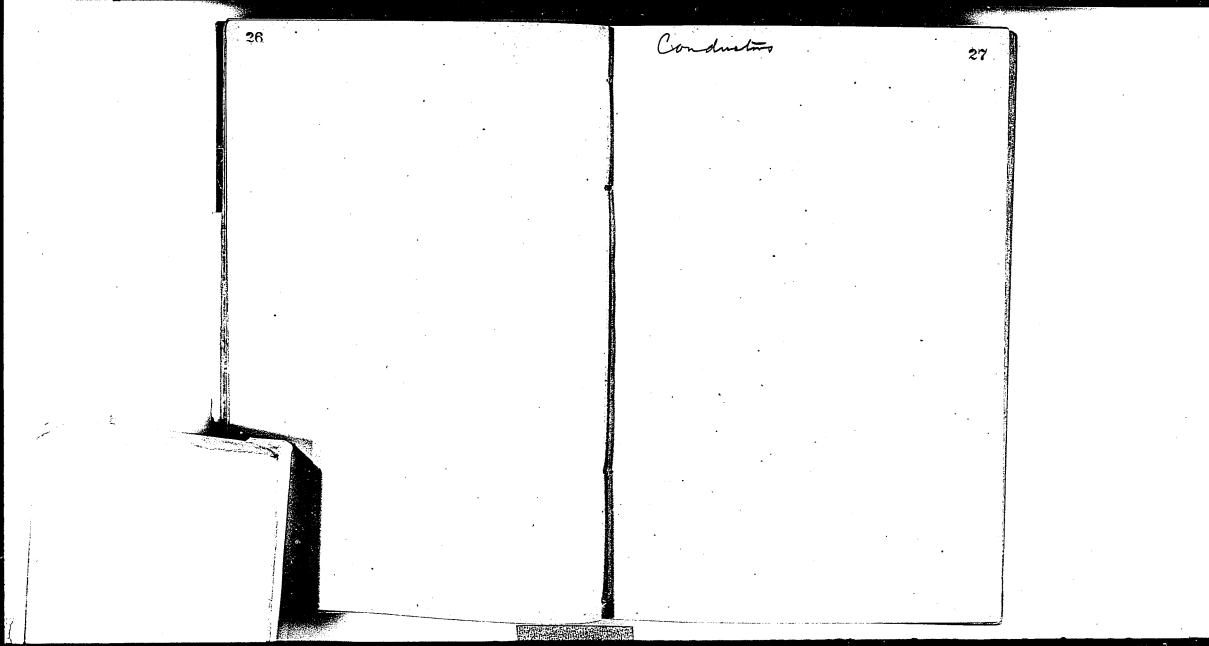
Faradic Machines

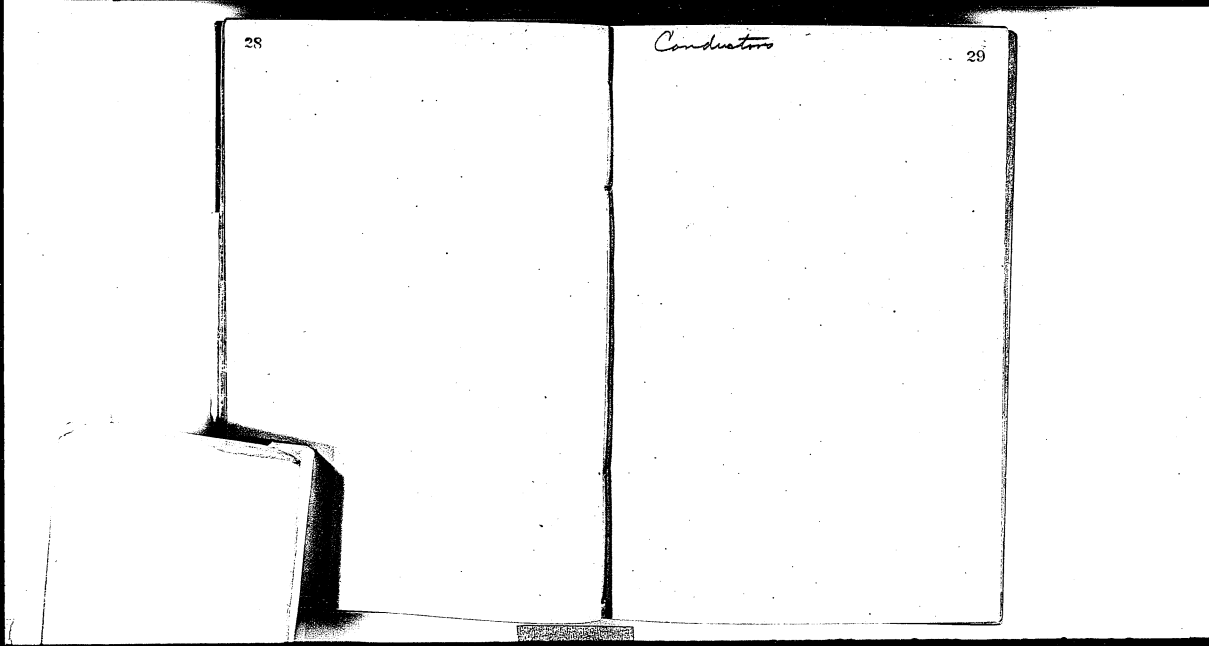
Shaft
Sole plate
Bearings
Sleeve

Estimated Mar. K
$350









Estimate taken from the old one with revisions

Boilers & chimney for 1250 H.P at 3 lbs of coal	$ 21,000
Engines:	21.000
Foundations	2.000
Iron Structure	8 5.00
Wood flooring	1 000
Water heaters and pumps	7.000
Iron floor and supports	6 000
Faradic machine	24000
	85.500
	50.000
	$ 135.500

5 per H.P.
6 per H.P.
7 per H.P. in current 75% back
8 per H.P.
9 per H.P.
10 per H.P.

Conductors

From Thomas street to Canal Street 1600 feet 2.8 inches on large map of Surv.

~~40 X 7~~ = 1600 feet

~~280~~ = 1600

7 = 40

7 divisions = 40 feet

2.8

The District bounded by
Wall in No. 4
all No. 6
all No. 5
To New church in No. 3

Line
36 District No 3

Broadway

Wall to Pine	240
Cedar	200
Liberty	175
Maiden Lane	240
	855
Nassau	855
Wall	310
Pine	316
Cedar	320
Liberty	320
Maiden Lane	330

District No. 4.

Wall Street

W. William to W. Nassau — 435 feet

W. Pearl to W. William	238
	282
	520 feet
W. Water to W. Pearl	180 feet
W. Front to W. Water	202
W. South to W. Front	270
	1697
	2
	3214
	2
	6428

Fire District No. 4

Pine Street

W. William to W. Nassau	430 feet
W. Pearl to W. William	520 feet
W. Water to W. Pearl	150
N. Front & W. Water	202
W. South to W. Front	270
	1602
	2
	3204 feet
	2
	6408

Cedar Street

W. William to W. Nassau	430
W. Pearl to W. William	520
	950
	2
	1900
	2
	3800

For District No. 4

Liberty St.

W. William to Nassau	430. feet
Maiden Lane to William	200
	630
	2
	1260
	2
	2520

Maiden Lane

W. William St to W. Nassau	455 feet
W. Pearl to W. William 300 250	550
W. Water to W. Pearl	260
W. Front to W. Water	202
W. South to W. Front	270
	1737
	2
	3474
	2
	6948

District No. 4

Nassau St.

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	210
	670
	2
	1340 ft
	2
	2680

William Street

N. Pine to N. Wall	240
N. Cedar to N. Pine	210
N. Liberty to N. Cedar	210
N. Maiden Lane to N. Liberty	200
	860
	2
	1720
	2
	3440

Fire district No. 4

Pearl Street

N. Pine to N. Wall	240 feet
N. Cedar to N. Pine	210
N. ~~Maiden Lane~~ to N. Cedar	270
	720
	2
	1440
	2
	2880

Water Street

N. Pine to N. Wall	210
N. Maiden to N. Pine	280
	490
	2
	980
	2
	1960

Fire District No. 4

Front Street.

N. Pine Street to N. Wall St.	210
N. Maiden Lane to N. Pine	290
	500
	2
	1000
	2
	2000

South Street

N. Pine to N. Wall St	210
N. Maiden Lane to N. Pine	290
	500
	2
	1000
	2
	2000

Fire district No. 5

TAE

Maiden Lane

W Gold St. to W Pearl	243 feet
W. Pearl to W. Water	274
W Water to W. Front	203
W. Front to W. Water	300
	1020

Fletcher St

W. Pearl W. Water	280
W. Water to Front	210
W. Front to South	291
	681
	1362

TAE

Fire No 5

Platt Street 3.0

John St and Burnley slip

Gold to Pearl	400
Pearl to Water	214
Water to Front	220
Front to South	297
	1131

234
768

Fire No 5

Fulton St

W Gold to Cliff	300
W Cliff to Pearl	245
W Pearl to Water	132
W Water to Front	215
W Front to South	306
	1198
	195
	1393
	4
	5572

Tar

Fire No 9

Bateman St

Sold to Cliff	478
W Cliff Pearl	245
Water	208
Front	194
South	223
	1348
	4
	5392
Jerry Peck slip	
Sold - Cliff	481
Pearl	230
Water	220
Front	200
South	196
	346
	2
	1792

Fire No 5

Frankfort & Dover

Jacob	216
Cliff	190
Pearl	225
Water	363
Front	192
Erith	192
	1378

Tal

Fire No 5

Folds	Ste		
N. Maiden	Platt St	273	
	John	153	
	Fulton	415	596
	Beekman	265	1544 530
	Ferry	333	
	Frankfort	270	
		1669	
Front	Street	317	

THC

Fire No 5

Cliff St

John to Fulton 375

Beekman 268

Ferry 330

Frankfort 358

1331

Pearl St

No Maiden Lane to Platt 300

John 145

Fulton 348

Beekman 265

Ferry 360

Frankfort 374

1792

Fire No 5
Water Street
Maiden Lane to Fletcher

	142
Burling Slip	250
Fulton	340
Beekman	300
Peck Slip	378
Dover	408
	1818
	40 ½
	1410
	4
	1640

Tac

64

65

Fire No. 5

South St

Maiden	Fletcher	133
	Burling Slip	213
	Fulton	257
	Beekman	287
	Peck slip	358
	Dover	384
		1672
		344
		1328
		322 320
		125

South St

Maiden	Fletcher Tag	125
	Burling Slip	200
	Fulton	250
	Beekman	300
	Peck slip	340
	Dover	413
		1629
		433
		1215
		2
		2430

Fire Blk. 6.

Maiden Lane

W. Gold to W. William	330
W William to W Nassau	445
E Broadway	340
Platt Street	280
	4
	1120
John Street	
W Gold to William	280
Dutch	150
Nassau	230
	690
E Broadway	370
	3760

Fire No 6

Fulton

W. Gold William 280
450
Nassau 380
Broadway 1110
300
730
2920

Ann Street

Gold to William 300
425
Nassau 350
Broadway

Beekman St.

Gold to Williams 335
Nassau 370
Park row 225
Broadway 930 250
1860

Line No. 6

Spruce St.

W. Gold to W. William St 370
Nassau 370
Park row

City Hall 335

Frankfort St. 380
W. Gold to W. William St 280
Park Row

Tel

Fire No. 6

Broadway

N Maiden Lane to	St John	215
	Fulton	255
	Ann	140
P.O	Beekman	500

Park Row

Ann to	Beekman	440
	Spruce	300
	Frankfort	225

Tar

Nassau Street

Maiden Lane to	John	210
	Fulton	320
	Ann	150
	Beekman	360
	Spruce	200
		1216
		4
		4864
		242.

Fire No. 6
William Street

Maiden Lane to John	310
Fulton	370
Ann	140
Beekman	235
Spruce	250
Frankfort	1305
	4
	5220

Tax

Gold Street

Maiden Lane to John	260
	180
Fulton	390
Ann	290
Beekman	245
Spruce	310
Frankfort	

From center to corner of Wall & South

to John	195
on John & Burling Slip	834
Front	346
	500
	1875 feet

Dover & South 2000 feet

~~THL~~ 11

750 places in Map 5

To Herald	To E
	195
To Nassau	730
	150
	300
	1375 feet
To Times	
	1250 feet.
U.S. Treas	1600 Let

78

79

In Fire No. 4

Boundaries of district

South — Wall — ~~side~~ Nassau — Maiden Lane

||| 349 buildings

In Fire No. 5

Boundaries

Maiden Lane — Gold St — Ferry St & Peck Slip — South St.

T & E

|||| 443 Buildings

Fulton market

Fish market

Wall St & Salts St Ferry

In ~~Fire district~~ Insurance No. 6

Maiden Lane — Nassau

Spruce — Gold

Houses in district bounded by
Beekmans & Gold Sts and
Nassau & Liss and Maiden Lane
taking a space like this as an
Average size building

14 17
10 16
27
15
20
37
~~29~~
18
25
21
56
29

271

TAE

349
443
279
1063 Houses

Taking the small homes as making an average with the large places and estimating a few that two houses equal one there are about 1063 Houses in the districts as mentioned each way 100 X 25

T.A.R

Counting separate houses and buildings.

In Insurance No 4

Along Wall St = 38
Bet Wall + Pine Sts = 54
" Cedar + Pine Sts = 34
Pearl, Maiden Lane,
South Pine Sts, =

TWE

Counting separate houses and buildings.

Insurance No 4

Wall, Nassau, Pine, William. = 20
20 Houses.

Wall, William, Pine, Pearl. = 23
23 Houses

Wall, Pearl, Pine, Water, = 17
17 Houses

Wall, Water, Pine, Front, = 17
17 Houses.

Wall, Front, Pine, South. = 23
23 Houses

Pine, Nassau, Cedar, William = 20
20 Houses

Pine, William, Cedar, Pearl, = 32
32 Houses

Pine, Pearl Maiden Lane, Water = 22
22 Houses

174

Continued on next page

carried forward from page 87

Pine, Water, Maiden Lane, Front - = 22
22 Houses.

Pine, Front, Maiden Lane South - 22
22 Houses

Cedar, Nassau Liberty - William = 22
22 Houses

Cedar William Liberty, Pearl, = 32
32 Houses

Liberty, Nassau, Maiden Lane
and William - = 26
26 Houses

Liberty William Maiden Lane = 6
6 Houses

304

Total in Ins, No 41

TW

Insurance No 5

	Houses
Maiden Lane, Gold, Platt, Pearl, =	28
Maiden Lane, Pearl, Burling Slip, and Water, =	41
Maiden Lane, Water Burling Slip Front =	9
Maiden Lane, Front, Burling Slip and South =	30
Burling Slip, South, Fulton, Front =	14
Front, Burling Slip Fulton Water =	21
Water, Fulton, Pearl, Burling Slip =	16
John, Pearl, Fulton, Cliff =	28
Gold, John, Cliff, Fulton =	24
John, Gold, Platt, Pearl, =	25
Fulton, Gold, Cliff, Beekman =	26
Fulton, Cliff, Beekman Pearl =	26
Fulton Pearl Beekman Water =	22
Fulton Water Beekman Front =	20
(Fulton Market) Front, Beekman South and Fulton =	1
Front, Peck Slip, Beekman South =	26
Front Beekman Water, Peck Slip, =	24
Water, Beekman, Pearl, Peck Slip, =	33
	413

continued on next page (91)

Insurance No 5

Carried forward from page 91 = 413

Beckman, Cliff, Pearl, Ferry = 26

Cliff Beckman, Gold, Ferry, = 29

Total in Insurance No 5. 468

Insurance No 6

Maiden Lane, Gold, Platt, William = 25
Platt, Gold, William John = 13
Maiden Lane John Nassau William = 37
John, Nassau, Fulton William 38 40 = 40
John, William, Fulton, Gold, = 24
Fulton, Nassau, William, Ann, = 15
Fulton, William, Ann, Gold = 15
Ann, Nassau, Beekman, William = 37
Ann William, Beekman, Gold = 15
Beekman, Nassau, Spruce, William = 23
Beekman, William, Spruce, Gold, = 25
Total — 269

District 4 — 304
" 5 — 468
" 6 — 269
1041 Total

T W G

Place Station between

Platt — Gold — John — Pearl

To supply district bounded by

Wall — Nassau — Spruce, Ferry &

Peck slip — South.

Distances to corners

South and Wall ~~1830~~ feet
1780

Wall and Nassau 1860 — 1720

Nassau & Spruce 1820

Bowling Slip & South 1820

TWR

Place Station between

Platt – Gold – John – Pearl

To supply district bounded by

Wall – Nassau – Spruce, Ferry &

Peck slip — South.

Distances to corners

South and Wall ~~1830~~ 1780 feet

Wall and Nassau 1860 – 1720

Nassau & Spruce 1820

Burling Slip & South 1820

TWR

Distance from Station to cor of South and Pearl Sts —

Distance from station to cor of South and South Burling Slip 80
950
1030 ——— 1030

Distance from ~~Station to~~ South cor of Burling Slip to north cor South and Pearl — 330 | 1030
420 | 750
750 | 1780 Total ——— 750

From South Cor Burling Slip and ~~Beekman slip~~ to South cor of Peck Slip — 875 ——— 875

From Station to Cor of Spruce and Gold Sts, —

TWR

From Station to cor. of Spruce and Gold Sts, 50
170
940
1160 ——————— 1160

From cor Spruce and Gold to cor. Spruce and Nassau ———— 660
1820

T&R

From Station to cor Wall and Pearl Sts

150
310
480
940. Total —— 940 ft

Cor Wall and Pearl to corner of Nassau

920
940
1860. Total 920

Total 1860 ft

TJR

From Station to Maiden Lane through Buildings. 380 ft. — 380

From cor Maiden Lane to cor of William and Liberty Sts. 380

To cor of Wall and William 540

~~From cor of Liberty and~~ 420

From Wall and Liberty to Wall and Nassau 420

380
380
540
420
1720

Total 1720 ft

TWR

No Samp	Distance of Ft	dft in Cross section Drive	Lbs of Sand Drive.
3	1780	.00864	118.8
2	1760	.00570	77.4
3	1740	.00846	112.4
15	1720	.04819	553.5
3	1640	.00795	101.1
2	1600	.00518	64.
3	1580	.00768	93.6
3	1560	.00516	91.2
3	1540	.00747	88.8
3	1520	.00738	86.4
3	1500	.00729	84.3
2	1760	.00570	77.4
3	1740	.0087	120.
3	1720	.00861	117.3
4	1700	.01080	144.4
5	1690	.01875	178.5
6	1680	.01682	211.8
10	1600	.02529	320.
3	1580	.00768	93.6
10	1560	.02530	304.0
25	1520	.06255	720.
5	1510	.01220	144.4
3	1500	.00729	84.3
122		.32305	3985.1

Small	87358	Total
Medium	5360	96420
Large	3702	

TW

Small Cable

Wire No. 0" .134

sq. in. 0.10564

6 wires

.3384

1740 feet of No. 10 wire in Ck

94.6 lbs.

1740

.054 lb

6

.324

600

254.400 lbs

2

508.8 lbs Cu in lines

$\bar{1}.1271$
$\bar{1}.1271$
0.4969
$\bar{2}.7511$

1.9759
3.2405
$\bar{1}.7354$

300
230
70
600

Square No. 1.

220 Lamps

230
180
130
390
185
1115
195
1310 feet main line
2620
2

Main

.00212
220
4240
424
.46640 sq. in.

Main

215
220
4300
430
47300 lbs Cu

Small lines

230
70
300
2
600

No. 2

.054 lbs. Cu. to 1 foot

Qty 1/2 lb. of main & 134 diameter
i.e. No. 10 wire

6 wires makes good cable

Small cables

386
256
143
137
1052 feet
40 feet from side walks
1092 feet
2
2184 6 wires 1/8 lb
054 per foot
2184
726 lbs.

Square No. 2

Not exact but close

1115
40
1075 feet
150
1075
135
930 feet from corner where it joins other main lines
380
1310
1075
2385 2500 feet main
1192 average

.00192
320
5760
576
.6336 eq in .65 sq. in

17.7
320
5310
531
5841.0 lbs 600 lbs

Small line 386
257
143
137
522 X 2 = 1044

Small cable

180
394
390
137
1101 feet
~~367 lbs Cu~~
1141
2
2282
760 lbs. Cu.

390
137
385
385
180
180
1637 feet small pipe

Square No. 3.
300 lamps

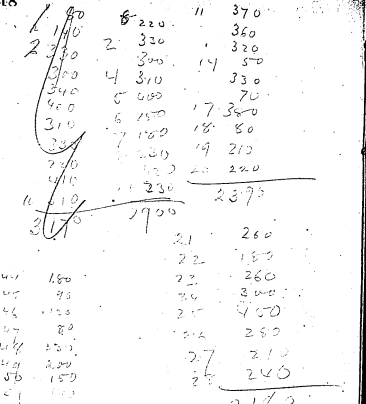
40
180
130
390
185
925 feet main to comm

137
390
527 in small m. mains

137
396
533
266 feet average to be added
925
1191

.00197
300
.57600 sq. in

17.7
300
5310.00 lbs. Cu.



Room No. 7

29	155		36	180	
30	260		37	90	
31	200		38	200	
32	160		39	70	
33	200		40	110	
34	140		41	140	
35	240		42	120	
	1355		43	180	
				1100	

Tar

2900
2390
2180
1190
1355
1100
11115 lamps

Square No. 4

3. 4

Square No 1. 270 lights

" "

390
396
192
188
1152 Total Ft in block
70 Ft in sidewalk
1199 Totals.

145
192
39.3
137
34.8
137
36.1
80.
61.1
198.
40.
242.
242.
157.5
1527.0 Ft from + on no 1 to + on no 22.

145
39.3
137.
34.8
137.
36.1
80.
61.1
198.
40.
242.
242.
157.5
1832.0 Ft from — on no 1 to — on no 22

Square 2. 333 Lights

143
385
137
317
1052
40 sidewalks
1092 Idlit

192.5
137.
84.8
137.
36.1
80.
61.11
198.
42.
242.
24.2
157.5
1340.2 from + of no 2 to + of 22

195.5
34.8
137.
36.1
80.
61.1
198.
40.
242
24.2
157.5
1264.2 Gr from - of 2
to - of 22

Square 3. 300 Lights

180
137
390
364
1107
40 sidewalks.
1141 Idlit

197
137
36.1
80.
61.10
198.
40.
242.
24.2
157.5
1173.9 Gr from + of no 3 to
+ of no 22

197.
36.1
80.
61.1
198.
40.
242.
24.2
157.5
1035.9 Gr from - of no 3
to - of 22

Square 4. 340 Lights

170
80
395
405
1050
40 sidewalk
1090 Total

197.5
80.
61.1
198.
40.
242.
24.2
157.5
1000.3 Ft-Form + ℄ no 4
℄ + ℄ no 22

212.5
61.1
198.
40.
242.
24.2
157.5
1205.3 Ft-Form − ℄ no 4
℄ − ℄ 22

Square 5. 400 Lights

178
400
814
264
1256
40 sidewalk
1296 Total.

202.
198.
40.
242.
242
157.5
861.7 Ft-Form + ℄ no 5
℄ no 22

182.
40.
121.
242.
242
157.5
986.7 Ft-Form − ℄ no 5
℄ − no 22

7541

Square 6. 250 lights

297
190
198
267
947
40 sidewalks.
987 Total

193.5
198.
44.4
192.
40.
235.
22.6
185.
1045.5 ft from [illegible] to [illegible] of 22.

148.5
44.4
192.
40.
235.
22.6
185.
867.5 ft from [illegible] to [illegible] of 22.

Square 7. 160 lights

64
325
300
162
854
40 sidewalk
894 Total

150
44.4
64.
40.
235.
22.6
185.
741.0 ft from [illegible] to [illegible] of 22

164
44.4
40.
235.
22.6
185.
691.0 ft from [illegible] to [illegible] of 22.

Square 8 220 lights

119
378
110
330
987
40 sidewalks
1027 Total

190
54.3
328.
44.1
40.
235.
22.6
185.
1499.0 from +9 no 2
to +9 no 22

189
110.
54.3
328.
40.
44.1
235.
22.6
185.
1207.0 from -9 no 8
to -9 no 22

Square 9. 460 lights

296
376
341
185
1198
40 sidewalks
1238 Total

188.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1247.2 from +9 no 9
to +9 no 22

170.5
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1414.7 from -9 no 9
to -9 no 7

Square 10. 230 Lights

188
198
300
838
1019
40 sidewalk
1059 Total

168
45.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1463.1 from + of no 10
to + of no 22

150
193
49.9
185.
40.2
110.
54.3
328.
40.
44.1
235.
22.6
185.
1617.1 from - of no 10
to - of no 22

Square 11. 370 Lights

188
198
487
492
1360
40 sidewalk
1400 Total

243.5
185.
23.11
126.
34.11
115.
52.10
247.
142.5
35.2
1191.4 from + of no 11
to + of no 22

246
22.11
185.
34.11
115.
52.10
247.
142.5
35.2
1092.9 from - of no 11
to - of no 22

Square 12.

360 Lights

140
108
494
500
1242
40 sidewalk
1282 Total.

247.
104.
34.11
115
52.10
247.
142.5
35.2
980.91 ft from mst 12
⅛ + ℄ 22

250
34.11
115
52.10
247.
142.5
35.2
877.8 ft from - ℄ no 12
⅛ - ℄ no 22

Square 13.

320 Lights

130
500
498
115
1243
40 sidewalk
1283 Total

250
115.1
52.1
247.
142.5
35.2
841.81 ft from + ℄ no 13
⅛ + ℄ no 22

40.
17.
25
154
157.5
425.5 ft from - ℄ no 13
⅛ - ℄ no 22

Square 14. 50 lights

70
162
180
412
40 sidewalk
452 Total.

81
52.6
134.
17
25
156. 3/4 gas.
157.5
623.1 ft from + of no 14
to + of no 22

90
52.6
134.
17.
25.
156.
157.5
632.1 ft from − of no 14
to − of no 22

Square 15. 320 lights

194
268
243
17
222
884
40 sidewalk
924 Total

134.
17.
25.
156.
157.5
489.5 ft from + of no 15
to + of no 22

627.5
26.5
142.5
229.5 ft from − of no 15
to − of no 22

Square 16.

110 lights

121
122
242
285
720
40 sidewalk
760 Total.

60.5
235.
22.6
185.
503.1 ft from + of no 16 to + of no 22

61
22.6
185.
268.6 ft from - of no 16 to - of no 22

Square 17

280 lights

395
369
241
268
1207
40 sidewalks.
1247 Total

1675
44.1
235.
22.6
185.
654.2 ft from + of no 17 to + of no 22

181.5
44.1
22.6
185.
433.2 ft from - of no 17 to - of no 32

Square 18. 80 Lights

112
120
258
258
748
40 sidewalk
788 Total

129.
54.6
363.
44.1
22.6
185.
798.3 ft from + of no 18
to + of no 22

129
120
54.6
363.
44.1
22.6
185.
918.3 ft from − of no 18.
to − of no 22

Square 19. 210 Lights

180
95.
162
290
227
40 sidewalk,
867 Total

131.
40.2
120.
54.6
363.
44.1
22.6
185.
960.5 ft from + of no 19
to + of no 22

148.
95.
40.2
120.
54.6
363.
44.10
22.6
185.
1069.50 ft from − of no 19
to − of no 22

Square 20. 220 lights

192
191
298
320
1001
40 sidewalk.
1041 Total

160
191
495
40.2
120.
54.6
363.
44.1
22.6
185.
1290.0 ft. from - q no 20
to - q 22

149
493
95.
40.2
120.
54.6
363.
44.1
22.6
185.
1123.0 ft from + q no 20
to + q no 22

Square 21, 260 lights

234
224
285
247
990
40 sidewalk
1030 Total

123.5
142.5
35.2
301.2 from - q no 21.
to - q no 22

117
142.5
35.2
294.7 from + q no 21 to
+ q no 22

Square 22. 140 Lights.

117
109
315
370
911
40 sidewalks
951 Ft.

Central station block
measure of block in Ft.
only needed.-

Square 23. 260 Lights

370
335
135
335
1175 Ft sidewalk
1175 Total.

77.5
44.9
44.8
197.2 Ft. from t'g no 23
to t'g no 22.

137.5
335
44.9
44.8
562.2 Ft from t'g no 23
to t'g no 22

TBG

Square 24. 5. lights

286
378
215
218.
1089
40 sidewalks
1129 Total.

143
48.4
335.
44.9
44.8
616.1 ft from 4 g no 24 to 4 g no 23

185.
218.
48.4
335.
44.9
44.8
876.1 ft from 1 g no 24 to 1 g 22

Square 25. 450 lights

222
285
378
418
1303
40 sidewalks
1413 Total

189.
50.8
218.
48.4
335.
44.9
44.8
930.9 ft from 4 g no 25 to 4 g no 22

214
285
50.8
218.
48.4
335.
44.9
44.8
1240.9 ft from 1 g no 25 to 1 g no 22

Square 26. 290 lights

193
204
320
297
1014
40 sidewalk.
1054 total

148.5
193.
44.8
386.3 ft from ⊕ no 22

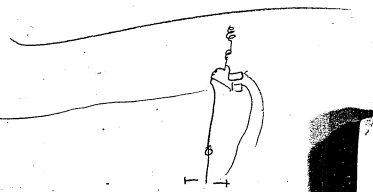
160
44.8
204.8 ft from ⊕ no 26
to ⊕ no 22

Square 27. 210 lights

222
218
202
198
840
40 sidewalk
880 total

111
48.7
320.
44.8
524.5 ft from ⊕ no 27
to ⊕ no 22

189
48.4
297.
193.
44.8
692.2 ft from ⊕ no 27
to ⊕ no 22



Square 28. 260 lights

285
331
195
188
999
40 sidewalk
1039 Total.

1425
536
222.
487
320.
448
8316 Ft from +q no 5 to +q no 22

1655
53.
218.
48.4
297.
193.
44.8
1019.7 Ft from -q no 28 to -q no 22

Square 29. 155 lights

138
165
179
187
672
140 sidewalk.
712 Total

84.
259
244.
67.
88.
37.4
160.
1421.5
35.2
884.0 Ft from -q no 29 to -q no 22

69.
179
259
244.
67.
88.
37.4
160.
1421.5
35.2
1048.0 Ft from +q 29 to +q 22

Tot

152

Square 30.

320 Lights

244
225
174
213
856
40 sidewalk
896 Total.

87.
224.
67
88
37.4
160.
1425
35.2
861.1 Gl from + g no 31 to + g no 22

106.5
67.
88.
37.4
160.
1425
35.2
636.6 Gl from − g no 30 to − g no 22

Square 31.

160 Lights

153

232
246
88
84
650
40 sidewalk
690 Total.

116.
88.
37.4
160.
1425
35.2
579.1 Gl from + g no 31 to + g no 22

123
37.4
160.
1425
35.2
498.1 Gl from − g 31 to − g no 22

Square 32. 160 Lights

249
207
176
240
883
40 sidewalk.
923 Total

120
124.5
50.1
142.5
35.2
472.3 ft from + to + 9 no 22

88.
124.5
50.1
142.5
35.2
440.3 ft from − 9 no 22 to − 9 22

Square 33. 150 Lights

155
77
207
210
809
40 sidewalks.
849 Total

77.5
49.1
45.17
185.
356.77 ft from + 9 33 to + 9 no 22

48.8
287.
49.1
45.1
185.
614.7 ft from − 9 33 to − 9 22

Square 94. 150 Rights

193.
167.
211.
219.
790
40 sidewalks.
830 Total

96.5
47.6
287.
49.1
45.17
185.
710.37 ft from 4 no 34
3 4 no 22

83.5
219.
47.6
287.
49.1
45.17
185
916.37 ft from 4 no 34
to 4 22

Square 95. 240 Rights

910
930
167
186
993
40 sidewalks.
1033 Total

83.5
49.5
219.
47.6
287.
49.1
45.17
185.
965.87 from 4 no 35
4 no 22

93.
310.
49.5
219.
47.6
287.
49.1
45.17
185
1285.37 ft from 4 no 35
to 4 22

Tap

Square 36.

180 Lights

188
192
185
186
694
40 sidewalk
734 Total

79
188.
24.1
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1312.71 ft from + of 36 to + of 22

78
24.1
55.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1139.71 ft from − of 36 to − of 22

Square 37.

90 Lights

89
50
157
135
421
40 sidewalk
461 Total

78.5
59.
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1100.11 ft from + of 37 to + of 22

77.5
23.8
135.
63.11
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
1040.11 ft from − of 37 to − of 22

Tag

Square 38. 160 Lights

135
134
133
135
577
40 sidewalk
617 Total

76.5
135.
63.11
80
23.4
45.
240.
124.5
50.1
142.5
35.2
1015.91 ft from +9 no 22

77.5
63.11
86.
23.4
45.
240.
124.5
50.1
142.5
35.2
1111.91 ft from −9 no 38 to −9 no 22

Square 39. 90 Lights

157
80
163
79
479
40 sidewalk
519 Total

78.5
80.
23.4
45.
240.
124.5
50.1
142.5
35.2
819.2 ft from +9 no 45 +9 no 22

81.5
23.4
45
240.
124.5
50.1
42.5
35.2
672.2 ft from −9 no 39 to −9 no 22

Square 40. 90 Lights

196
163
177
189
725
40 sidewalk
765 Stds.

81.5
45.
240.
124.5
51.1
142.5
35.2
719.8 ft from 1 to 7 no 40

88.5
44.9
176.
51.4
185.
545.8 ft from 1 to 7 no 40
to 1 to 7 no 22

Square 41 150 Lights

215
205
166
158
744
40 sidewalks
780 Stds

83.
49.9
105.
49.1
173.
44.8
574.8 ft from 1 to 7 no 41
to 7. no 22

79.
215.
49.9
105.
49.1
193.
44.8
785.8 ft from 1 to 7 no 41
to 1 to 7 no 22

Square 42. 120 Lights

141
141
194
194
670
40 sidewalks.
710 Total

70.5
100.3
79.
215
49.9
155.
49.1
193.
44.8
956.6 ft from 1 to 2

70.5
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1071.6 ft from 1 to 42
to 1 to 22

Square 43. 180 Lights

296
296
145
144
881
40 sidewalks.
921 Total

72.
296.
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1429.2 ft from 1 to 43
to 1 to 22

72.5
60.1
194.
100.3
215.
49.9
155.
49.1
193.
44.8
1133.7 ft from 1 to 43 to 1 to 22

Square 44 220 lights

196
194
214
220
624
40 sidewalks
664 Total

110.
241
55.
23.8
123.
843
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5

1342.3 ft from S of no 44 to S of no 22

107.
194.
24.1
85.
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5

1533.3 ft from S of no 44 to S of no 22

Square 45. 90 lamps

55
52
222
223
552
40 sidewalks
592 Total.

111.5
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5

1264.7 ft from S of no 45 to S of no 22

111
55
23.8
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5

1519.2 ft from S of no 45 to S of no 2.

Square 46. 120 Lights

223.
227
114
123
687
40 sidewalk
727 Total.

113.5
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1119.9 Ft. from – 0 to 46
– 0 to 22

111.5
123.
84.3
52.
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1240.9 Ft. from 0 to 2
to 0

Square 47. 80 Lights

62
43
230
230
565
40 sidewalks.
595 Total.

115.
52
22.2
66.6
163.
44.9
240.
124.5
51.4
157.5
1357.1 Ft. from 0 to 20
47 to 0 to 22

115
22.2
66.6
163
44.9
240.
124.5
51.4
157.5
985.1 Ft. from – 0 to 47
to – 0 to 22

Tie

Square 48. 220 lights

185
177
234
240
836
40 sidewalk
876 Total

117.
175.
66.6
179.
44.9
196.
124.5
51.4
157.5
1079.9 ft frame + ft in ft in 22

120.
66.2
197.
44.9
196.
124.5
51.4
157.5
917.5 ft frame - ft in 22

Square 49. 200 lights

148
115
244
250
757
40 sidewalk
797 Total.

122.
48.11
28.33
166.
49.9
49.1
193.
44.8
791.2 ft frame + ft in 49 ft + ft in 22

125.
48.11
155.
215.
49.9
155.
49.1
193.
44.8
1039.91 ft frame - ft in 49 ft - ft in 22.

Tie

Square 50. 150 Lights

222
225
198
187
832
40 sidewalks
872 Total.

99.
51.
76.5
92.6
158.
215.
49.9
155.
49.1
193.
44.9
1177.9 ft from + of 51
to + of 22

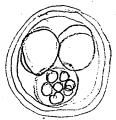
93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1365.8 ft from - of 1950
to - of 22

Square 51. 140 Lights

285
286
160
140
871
40 sidewalks.
911 Total.

62.
93.5
50.4
194.
70.5
92.6
158.
215.
49.9
155.
49.1
193.
44.8
1437.8 ft from + of 51
to + of 22

78
285.
50.4
145.
60.1
194.
158.3
79.
215.
49.9
155.
49.1
193.
44.8
1692.6 ft from - of 51
to - of 22



Sept 9 1850 DE

Length of distributing tubes —

~~No 99~~
D 599.
DN. 599.
N 39

	Distributing	Min. Distributing	Main	Main.	Main for Eg.
Blub 1	599.		599.	39.	
2	546.	1	546.		

51

6

Jer

Oct 15 1880

Distributing

599				155	
546					
570	1715			466	
544				180	
633				70	716
493	1671			870	
288				432	
513				296	1098
619	1415	4801			
529				363	
700				297	
641	1870			438	1098
890					
226				398	
684	1800			436	
122				370	1204
676					
894	1892	4862		530	
433					
520					
341	1294				
125					
507					
564	1196				
706					
204			716		
440	1350		3840		
710			5402	3	
356			4462		
448	1514		4801	4	
345			1098		
227			1098	3	
423	997		1204		
413			530		
516			23651		
857	1298		3		
230			47302		
308			5902		
155					
	693				

Jer

Oct 15 1880

23650.

56.

Total

950
60
35.

67
7
469.

21/1750(83.00
168
20.

28/2900(100
280
20.

23651.
473 02
23650

56/3500(62.1/2
336
140
112
28

21/1750(80
168
2900

28

47303
16.92 2880

21

Feb

2 17 40
3

17. 21

Oct 15 1888

34.
14
272
34
61.

46/715(15.89
6

750

750
46
29.

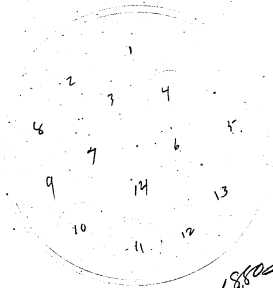
67
7
469.

21
25
105
40
525.

$7 \overline{)168}$ 24

$15 \overline{)84}$ $\frac{75}{9}$ (5 $\frac{15}{105}$ 15.

8. $\frac{15}{75}$



Oct 15 1850 [illegible]

$\frac{14}{98}$. $\frac{7}{98}$)

1500

$50 \overline{)5000}$ $\frac{50}{0}$ (100.

67
33
100

50

18. $1\frac{1}{5}$

17.

2. 100.
$2\frac{1}{2}$. 80
3. $62\frac{1}{2}$
4 100.

2 inch pipe. 17 c 21/170/8-mills
21 wires, (10) 3 of 7 — 184/2

2½ pipe. 29 c 28/280/10½ mills
28 wires, — 252

3 inch pipe 35 — 56/350/6 6¼ mills
56 wires. — 336/14

4 inch — 50. cents — 98/5000/6 5 mills per wire
98 wires. — 490.

Oct 15-1880

Cost of 49,302 feet distributing pipes 2 inch diameter (no mains) 47c for pipe 17c for rubber 34 Cents.

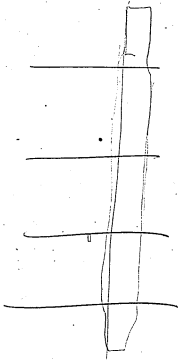
$16,052.68/100.

Oct 15 1880

Mains + Dis + Main

wi Wires,	feet.
11 & D	620

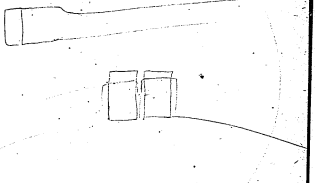
Oct 18 1880
TDE

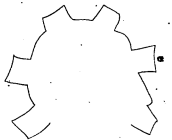


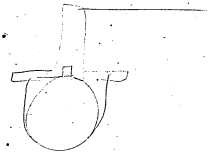
Total of distributing pipes without mains -

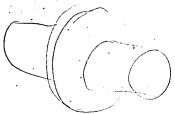
23651.

Oct 15-1880

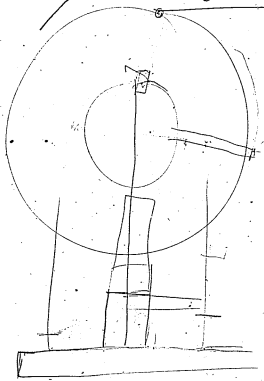




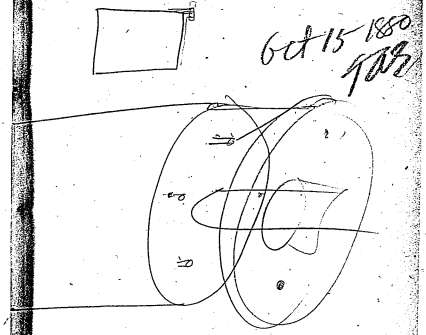


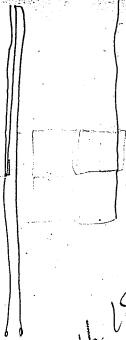


Oct 15 1880

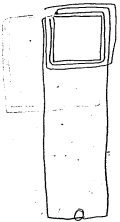


Oct 15 1880
T23





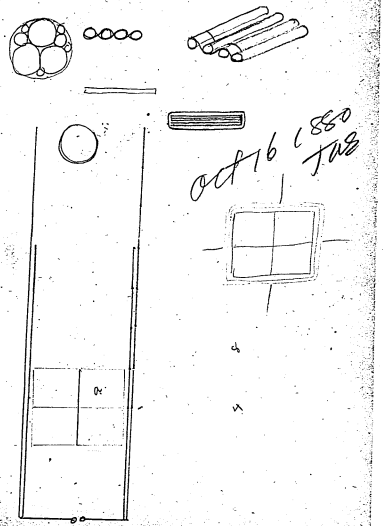
Oct 16 1850
JH



Oct 16 1850
JH

198

199



200

1.2825. No 2 25-

.5460 −28

11

·22

47302
22
94604
94604
0.40 6 11 17

190

6

16

6 1/3

13 each

12

201

47302
13
141906
47302
6,149.22.

52
52
209
260
274
108.16
108.16

118976.

16.
22
35.

1 1/2

54
54
216
270.6
2764

1664
1664
1283
0

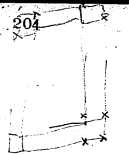
8 rows

12.
9

14.

13/20

Oct 16 1880 TAS



.6615
.2940
.9555

.7326
.3596
1.0832

.6934
.7326
1.4260

.2997
.7326
1.0323

.2820
.6750
.9570

+ .9754
.6750
1.6504

97

.7582
.6750
1.4332

No.	Sheet	Cross Section 100 Ohms	No. Wires 200 Ohms	Page 205
1	1858	.6615		24
	410	.9953		36
	203	.9555		34
	20	.3338		12
	20	.2940		10
2	1538	.7326		26
	2025	1.0832		39
	157	1.4260		50
	157	.5092		18
	612	1.0323		37
	14	.6934		24
	14	.5092		18
3	1400	.6750		24
	207	.9570		34
	157	1.6504		59
	157	1.4332		54
	205	.2490		9
	16	1.2508		44
	16	1.0098		36

.7480
.2754
1.0234

1250
.7480
.9980

2516
.7480
.9916

1.0098
.7480
1.7578

.2820
1.040
1.3220

1.5268
1.040
2.5668

1.0418
1.04
2.0818

3085
1.040
1.3485

2070
1.040
1.2470

967

2
.5125
.1750
.6875

2925
.5125
.7250

Test Cross section No Wires
4 2849 .7480 — 2.08 Ohms. 207
204 1.0234 — 26
10.0 1.9980 — 36
100 1.7578 — 71
205 .9996 — 62
41 1.2508 — 36
41 1.0414 — 44
37 K.A.

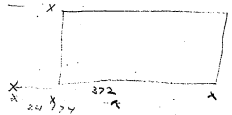
5
1818 1.040 — 37C
210 1.3220 — 47
386 2.5668 — 91
386 2.0818 — 74
202 1.3485 — 48
202 1.2470 — The 44 circuit shown must be omitted

6
1540 .5125 — 18
218 .7250 — 26
158 .6875 — 24
24 .2125 — 8
24 .1750 — 6

.2880
.0960
.3840

1.2438
.2880
1.5318

348
24
372



.271
1.150
1.421

.215
.42
.635

.42
.266
.686

.826
1.150
1.976

.786
.42
1.156
1236
200
1436
196
1633

1.041
.420
1.461
.524
1.985
1.67

186
198

.465
1.150
1.615

	Feet	Cross section	20% Ohms
7.	1012	.2680	10
	160	.3840	13
	184	1.5318	55
	174	1.2438	44
	372	1.1399	40
	24	1.2438	44
	24	.0960	4
8	1589	.420	2
	200	.686	3
	199	.635	3
	130	1.456	41
	130	1.461	52
	34	1.022	90
	34	1.041	37
9	1633	1.150	.41
	198	1.615	.57
	180	1.674	.59
	195	1.421	.51
	195	1.976	.70
	20	.736	3
	20	.826	3

1589
50
193
20
1862

1059
524
50
193
20
1846

.271
.483
.754

193
20
150

1054
316
1370

301
.483
.784

1.054
.355
1.409

12

.9360
.284
1.220

.355
936
1.291

.386
.936
1.242

1.242

1640
936
1.576

	Fish	Cross Section	No Wires
10	1846	.4880 —	17
	179	.754 —	27
	373	.784 —	28
	30	.271 —	10
	30	.301 —	11

Tot

11	2298	1.054 —	37
	461	1.409 —	50
	256	1.371 —	49
	20	.355 —	13
	20	.316 —	11

12	1819	.9360 —	33
	257	1.220 —	43
	260	1.191 —	42
	118	1.576 —	56
	118	1.242 —	44
	14	.639 —	23
	14	.571 —	20

.832
.218
1.050

.571
.832
1.403

.8572
.832
1.689

81.5
10 sec
91.5

81

3

VI

Feet Cross section

13

Feet	Cross section	
2100	.832	30
260	1.050	37
135	1.403	50
135	1.689	60
32	.857	30
32	.571	20
110	.108	4

14

738	.045	2
91	.0250	1
180	.0255	1
32	.0250	1
32	.0255	1

15

1675	.5920	21
181	.1248	4
121	.0576	2
10	.1499	5
10	.1343	5

1247

16.

1183	.1705	6
325	.04440	2
71	.10232	1
285	1.7668	62
255	1.3701	48
24	1.5963	56
24	1.3469	48

17.

2422	.7500	25
.177	1.1138	40
191	1.1842	42
251	1.5963	57
191	1.1842	42

18

1096	.1240	4
139	.1760	6
139	.1832	6
138	.5378	19
130	.5554	20
20	.4138	15
20	.4314	15

19

1226 — .3780 — 13
141 — .5256 — 19
145 — .5592 — 20
105 — .7398 — 26
105 — .7566 — 27
30 — .3618 — 13
30 — .3786 — 13

20

1561 — .4620 — 16
159 — .6888 — 24
170 — .6776 — 24
201 — .1980 — 7
201 — .6776 — 24

21

1595 — (.5460 — 15 — (62) 1.8463
(19) 15 — (72) 2.30611
127 — .6058 — (21) 15 — (84) 2.3688
133 — .6184 (22) (low 15 — (60) 1.8900
15-2 — 2.38634 (85)
15-2 — 2.85-211 (101)
15-2 — 2.91455 (103)
15-2 — 2.42503 (86)

22 TOR

only 1/2	495	2730	10
left side above	167	1.8403	65
	167	2.3061	82
right side above	195	2.36855	84
	195	1.87985	66
left side below	167	2.36855	84
	167	1.87905	66
right side below	195	1.2822	46
	195	1.8185	64
	25	2.5340	90
	25	2.6313	93

23.

1436.	.6110	22
87.	.6474	23
144.	.7280	26
355	.5239	19
355	.7770	27
28	1.1349	40
28	1.388	49

24.

4459	.6750	24
153	.8250	29
195	.8850	31
238	1.1725	42
238	1.3350	47
31	.4875	17
31	.6600	24

25.

2179	1.2825	45
199	1.62	57
224	1.732	61
295	1.6200	58

26.

1894	.6090	22
170	.6554	23
158	.6679	24
219	1.2822	46
213	1.8185	64
28	.2624	9
~~2681~~	~~.3308~~	~~12~~

222

The next two pages scribbled on were torn out by Hammer, contained nothing important. —

227

27.

1592 —	4305 —	15
121 —	.5187 —	18
119 —	.5481 —	19
23 —	.1742 —	6
28 —	2182 —	8

28.

1823 —	.5460 —	19
152 —	.1781 —	6
175 —	.3176 —	11

29.

1128 —	.22473 —	8
278 —	.35-65 —	13
94 —	.33480 —	12
steel 15 —	.13175 —	5
15 —	.11065 —	4

30.

1404	.5776	20
361	.1968	28
116	.17424	26
142	.192855	33
142	.175245	26
67	.35285	13
67	.17645	6

31.

955	.224	8
126	.2992	10
133	.2880	10
108	.65175	23
108	.46445	16
17		
17		

32.

1444	.2960	10
232	.3568	13
264	.3520	13
260	1.4404	51
260	1.25=94	45
80	2.308852	84
30	1.87985	42

33. Tab

1024	.2960	10
87	.2985	10
38	.3285	11
307	.5712	20
309	.5831	21
28	.3162	11
25	.3281	11

34.

1059	.2580	9
100	.3405	12
93	.3660	13
239	.5277	19
239	.3660	13
29	.2727	10
29	.1110	4

35.

1609	.1033	4
94	.6992	24
82	.7512	27

Tab

36.	1161 —	.2610 —	9
	89 —	.4518 —	16
	88 —	.4230 —	13
	14 —	.1908 —	7
	14 —	.1620 —	6
	751 —	.0955 —	3
	88 —	.1756 —	6
37.	87 —	.1711 —	6
	79 —	.3664 —	13
	79 —	.3331 —	11
	13 —	.2709 —	10
	13 —	.2376 —	8
38.	818 —	.1920 —	7
	86 —	.2251 —	8
	85 —	.2091 —	7
	155 —	.5925 —	21
	155 —	.5430 —	19
	43 —	.4005 —	14
	43 —	.3980 —	14

39.

	698	.0945	3
	88	.1549	6
	91	.1413	5
tops of circles	100	.65554	20
	100	.4925	18
across the street	22	1.0836	39
	22	.8394	31
side on street	183	.5618	20
	183	.5482	19

40.

	400	.1396	5
	91	.1917	7
	91	.1791	6
	197	.3462	12
	197	.3493	12
	25	2067	7
	25	2098	7

41. Tar

1012 —	.2325 —	8
93 —	.3015 —	11
89 —	.3285 —	11
235 —	.7948 —	28
235 —	1.1630 —	41.
72 —	.2574 —	9
72 —	.3102 —	72

42. 1368 — .1740 — 6
80 — .2676 — 9
80 — .2772 — 10
214 — .4314 — 15
214 — .4842 — 17
40 — .2574 — 9
40 — .3102 — 11

43. 15-13 — .3330 — 12
82 — .4968 — 17
82 — .5400 — 20

44.

1356	.3960	14
117	.6688	24
120	.6336	22
214	.6688	24
14	.2728	10
14	.2376	8
764	.1080	4
121	.2034	7

45.

121	.2068	7
79	.4762	17
79	.4374	15
13	.3682	13
13	.3294	12
1021	.1740	6
121	.2940	10

46.

123	.2820	10
143	.6622	23
143	.6114	22
64	.4882	17
64	.4374	15

Tax

47

875 — .0960 — 3
125 — .1632 — 6
125 — .1600 — 6
72 — .6714 — 24
72 — .6114 — 22
47 — .5618 — 20
47 — .5018 — 18

48.

1374 — .4500 — 16
337 — .6567 — 23
180 — .6202 — 22
205 — .6567 — 23
30 — .2067 — 7
30 — .1702 — 6

1403 — .3200 — 11
187 — .4480 — 16
125 — .4880 — 17
28 — .1280 — 4
28 — .1680 — 6

49

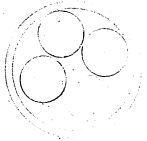
50. Tar

15 8 8 — .2700 — 10
109 . .4125 — 15
103 . .4365 — 15
30 . .3049 — 11
30 . .1665 — 6

1487 — .2590 — 9

51. at point grouting. .4012 — 14
(each)
385 — .4508 — 16
30 — .1422 — 5
30 — .1918 — 7

2 inch 28 wires



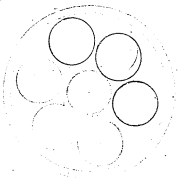
Tae

Oct 16 1880

inch

7 wires

2½ inch 49 wires.

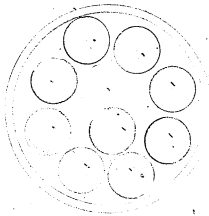


1½

14 wires

2-7's

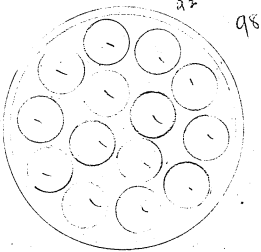
3 inch



70 wires

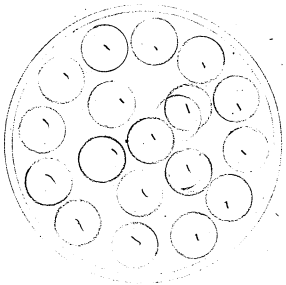
Oct 16
1850
JAR

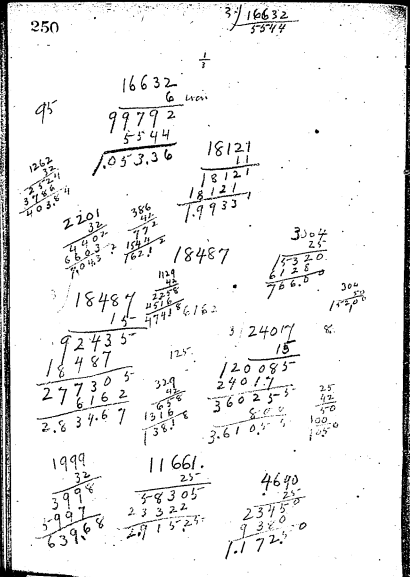
3½ inch



98 wires

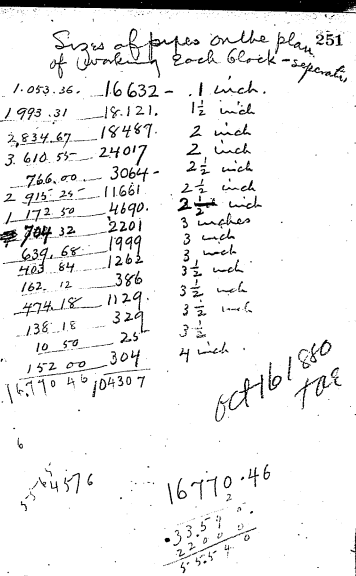
Oct 18 1880
Jar
4 inch
126 cones





Sizes of pipes on the plan of Work by each Clock - separate

1.053.36	16632	.1 inch.
1993.31	18.121.	1½ inch
2,834.67	18487.	2 inch
3 610.55	24017	2 inch
766.00	3064	2½ inch
2 915.24	11661	2½ inch
1 172.50	4690.	2½ inch
704.32	2201	3 inches
639.68	1999	3 inch
403.84	1262	3 inch
162.12	386	3½ inch
474.18	1129	3½ inch
138.18	329	3½ inch
10.50	25	3½
152.00	304	4 inch
16770.46	104307	



252

253

pi-
1267 — 270 — lamps
50
90
20
20
75
70
25
75
705 lamps

10 | 705
70

201.5
70
1410.50

Oct 16 1880
Jno

pi-
920.

50
150
20
25
70
70
40
40
120
80
80
40
50
30
100
50
190
50
1150 lamps

10 | 1150
115

115
105.5
920
115
1240

81-

649.

60
110
100
40
50
20
30
90
50
40
630

10|630
63

63
49.6
378
56.7
252
31248

1550

Oct 16 July

1082.

80
60
60
10
10
20
150
20
40
150
30
50
80
45
800

10|800
80

80
72.31
57847.80

1466.

Lamp.

120
100
90
40
60
35
20
30
20
25
35
50
60
50
80

970

884.

100
100
100
150

450

10/970
97

270.1
97
18961
24309
26199.1

10/450
45

96.8
45
4840
3872
4356.0

848.

Lamps

50
30
50
50
80
40
380

10/980
38

TM

90.3
96
7224

427.

30
200
40
270

2709
3431.4

220.

Lamps.

50
20
50
40
60
50
10
66
50
40
10
10
450

10/4500
45

6.65
45
3025
2420
27225

Lamps

20.

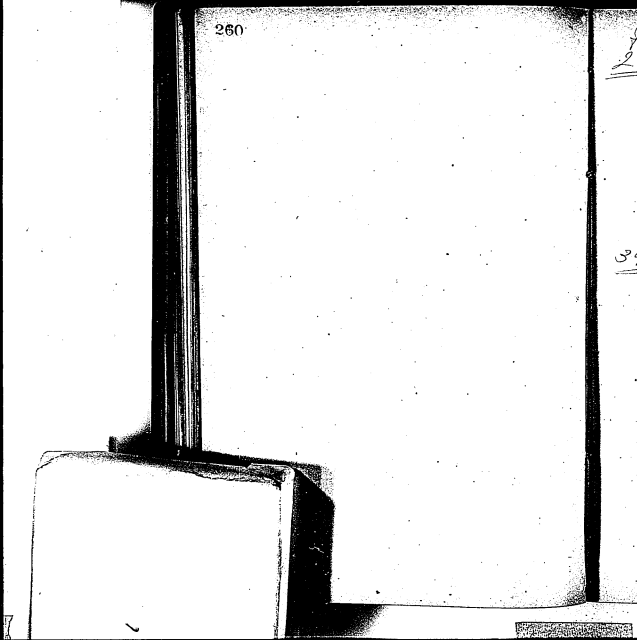
396.

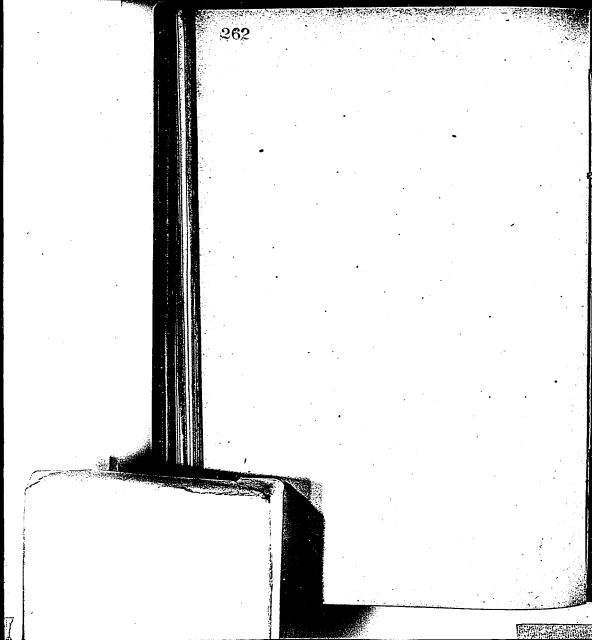
Lamps

10
150
50
70
40
30
40

360

10/360
36
20.
720.





765.

Lengths

140
40
70
40
150
80
150
150
40
735

140
90
40
30
60
40
150
620

10/735
73
5166
5054
5270.6

1162

10/620
.62
168.
.62
336
1008
10416.

91.
794.

Lamps.

50
80
50
160
90
80
70
120
700

10/900
70

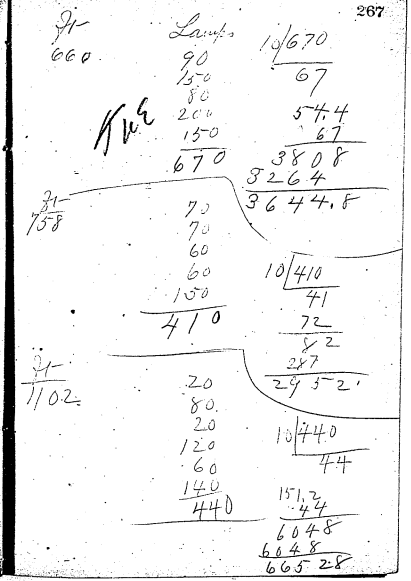
78.0
70
546.00

91.
225.

10/610
61

50
60
180
60
10
10
60
100
80
610

6.05
61
605
3630
369.05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544
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3808
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70
70
60
60
150
410
10/410
41
72
82
287
2952.
Jr
1102
20
80
20
120
60
140
440
10/440
44
151.2
44
6048
6048
665.28

1410.60
1242.
3124.8
5784.8
26199.1
4356.
3431.4
272.25

2-11-13 Cmd

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369.05
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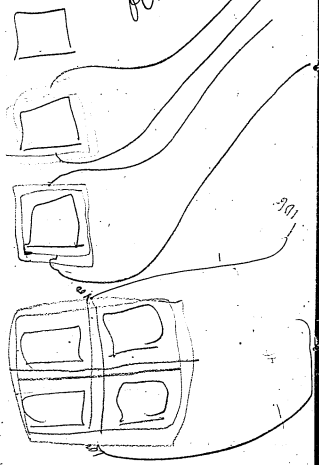
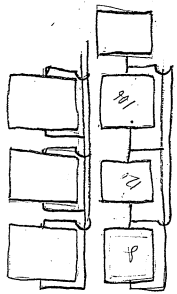
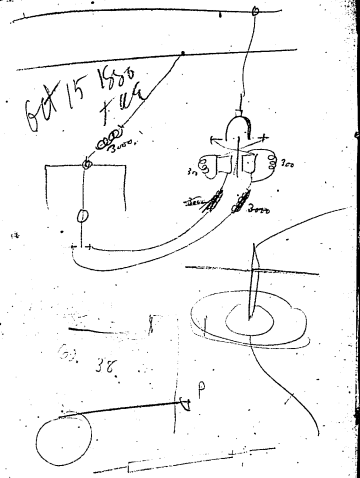
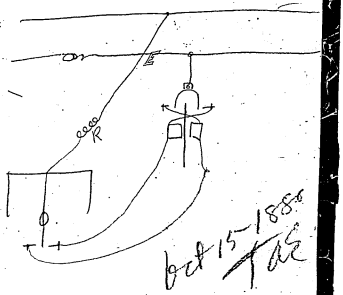
81306.10 Total with

Oct 15 1880 Tue



Oct 15 1880 Tues

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